Delaware Department of Transportation
Division of Transportation Solutions
Design Guidance Memorandum

Memorandum Number 2-5

1. Road Design Manual 2. Bridge Design Manual 3. Utilities Design Manual
4. Real Estate Manual 5. Standard Specifications 6. Standard Construction Details

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Title: Bridge Scuppers Effective date: June 1, 2002

Sections to Implement: _ Road, X Bridge, X PMT, _ Design Support, _ Specification, ___ Utility, ___ Real Estate, X Quality Management, X Field Services, X District, Other _____

I. Purpose:

To provide guidance on proper scupper design for preventing siltation and debris build-up when the use of scuppers is necessary.

II. Design Guidance:

1. Scuppers should be designed with proper inlet opening to minimize clogging from siltation or debris.
2. The installation of a drainage inlet upslope of the bridge can minimize the need of bridge deck scuppers and the clogging problem.
3. The downslope drainage inlet beyond the bridge should be designed assuming 50% of bridge deck scuppers are clogged.
4. The scuppers should be located at the desirable 2% minimum slope, both transversely and longitudinally, to achieve self-cleansing velocity.
5. The minimum height of a curb or parapet opening should be 4 inches. This consists of 3" curb opening and 1" deck depression with proper transition. The bottom side of the opening should be adequately sloped.

References:
1. Design of Bridge Deck Drainage, Hydraulic Engineering circular No. 21, FHWA May 1993.
2. Bridge Deck Drainage Guidelines, FHWA December 1986.
3. Bridge Design Manual, Chapter 3.

III. Justification:

Clogged scuppers are a widespread maintenance problem and they can add to a safety problem due to ponding or icing.

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